What farmers know: Experiential knowledge and care in vine growing

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Abstract

This article contributes to the critical debate on the choreographies of care in farming (Law 2010) through an exploration of the inter-dependence of care and situated expertise in the context of vine work. It argues that care as the totality of those activities which enable the maintenance, continuation, and repair of the farming 'world', to paraphrase Fisher and Tronto's (1991) classic definition, depends on experiential knowledge. According to Dreyfus and Dreyfus (1986) attentiveness, responsiveness, and adaptation to the material environment are characteristic of high levels of experiential expertise. Attentiveness, responsiveness, and adaptation are also what characterises good care (Tronto 1993, Mol 2008). Through an autoethnographic account of acquiring competence in vine work, the article illustrates how through practical engagement with the material and social environment of the farm key elements of the logic of care (Mol 2008) are acquired. In conclusions, the paper indicates some consequences of putting experiential knowledge at the heart of multi-scalar and multi-temporal cares farmers are increasingly asked to attend to.

Keywords: skill, experiential knowledge, plants, care, autoethnography

1. Introduction

The notion of care is becoming central to the current reconceptualisations of agrarian space and practice. Farmers both self-identify and are encouraged to see themselves as stewards of the land, investing in the future of their soils, crops, and crafts, and by extension our shared economies, environments, and health. Farms are also seen as key spaces in which to address the multiple cares of food security, environmental conservation (Burgess 2000, Kaljonen 2006, Morris 2006, Riley 2008), and bio-security (Ilbery et al. 2012, Law and Mol 2008), and become sites of audit, regulation, and control in the interest of those systemic, though locally enacted, cares. This article contributes to the critical debate on the choreographing of cares in farming (Law 2010) through an exploration of the inter-dependence of care and situated expertise. What this article argues is that care as the totality of those activities which enable the maintenance, continuation, and repair of the farming 'world', to paraphrase Fisher and Tronto's (1991) classic definition, depends on experiential knowledge. This paper firstly contributes to critical reflection on theories of care though an autoethnographic exploration of the centrality of experiential knowledge to enactment of care in vine growing. It illustrates how through practical engagement with the material and social environment of the farm key elements of the logic of care (Mol 2008): attentiveness, responsibility, and competency (Tronto 1993) are acquired. Secondly, it makes a call for recognition of experiential knowledge as central to the delivery of the multiple cares we are increasingly expecting and demanding of farmers today.

That good care is essential to good farming has now been suggested by a number of authors (Harbers 2010, Singleton 2010, Law 2010, Singleton and Law 2013). To date, care in farming has

been largely considered in the context of human-animal relations, and has drawn on the intellectual tradition of post-humanist studies which explore the affective and ethical dimensions of human-animal interactions (e.g. Holloway 2002, 2007). Mass killings during the foot and mouth outbreak has led some authors to question the assumed connection between care and affect, and to point to the tensions inherent in the spatial and temporal enactments of care (Law 2010, Law and Mol 2011). Care was no longer considered specific to human-animal interactions, but begun to be seen as a patterning of activities which support certain kinds of farming, and which can come into tension with other ways of organising the times and spaces of modern agriculture (Harbers 2010, Singleton 2010, Singleton and Law 2013). This understanding of care as a patterning of activities, or choreography (Law 2010), is important in that it extends the field of inquiry from specific interactions to the whole farm, and to the multiple realities farm activities contribute to and are influenced by, such as markets and regulatory regimes. In the context of this article, the notion of care is applied to human-vine relations, showing how in the acts of vine pruning a number of inter-acting cares inherent to grape growing in enacted, such as care for the vintage, for the marketability of the wine, for the longevity of the vineyard, and others.

This new understanding of care in farming is consistent with that proposed by feminist critiques, which understand care as not a sentiment or a kindness, something 'we can't afford', a sort of 'extra' added on to efficient and rational technologies and knowledges. Quite the contrary, care is seen as the totality of practices that makes these technologies and knowledges work. As in feminist critiques, also in farming we can understand care as a non-normative obligation, as 'more than an affective-ethical state: it involves material engagement in labours to sustain interdependent worlds' (de la Bellacasa 2012: 198). Thus in this paper care is understood as an ethos (de la Bellacasa 2010), a form of practical rationality (Ruddick 1990), or a logic (Mol 2008, Mol et al. 2010); in other words care as a practice rather than a principle or an emotion.

What this paper goes on to argue is that the delivery of care as a set of practices depends on expert situated knowledge. That care cannot be enacted though external systems of audit and ordering has been intimated by other authors: Singleton showed how the auditing of the Cattle Tracing System both colonised the practices of care on the farm, and was dependent on them for its existence (2010, and Law 2013), while Enticott made a similar argument for vet's enactment of bovine tuberculosis screening (2012). Feminist critiques of care have also pointed out that care requires both know-what and know-how, as it depends on one's ability to first recognise and then appropriately react to the identified need (Tronto 1993). While abstract knowledge may serve as a starting point for learning practices of care, experiential, situated, and often tacit knowledge is what enables care to be carried out, in farming and in other contexts (e.g. Mol 2008 on diabetes). Experiential knowledge can thus be seen as both a pre-requisite for care, and as a result of care, as through carrying out care as practice one may acquire further experience, which in turn should enable better caring.

In this article I explore the connection between experiential knowledge and care through an autoethnographic case study of acquiring competence in farming grape vines. This methodology allows me to explore in depth the process of acquiring a particular farming skill, and its connection to care. While the importance of experiential knowledge in farming has been already acknowledged, to date there has been no account of how such knowledge is acquired, a gap this

article addresses. Furthermore, an autoethnographic account allows me to systematically illustrate the inter-dependencies between experiential knowledge and care indicated in existing literature. According to Dreyfus and Dreyfus (1986) attentiveness, responsiveness, and adaptation to the material environment, be it in growing plants or other practices, are characteristic of high levels of expertise. Crucially, attentiveness, responsiveness, and adaptation are also what characterises good care (Tronto 1993, Mol 2008). I thus suggest that good care can only be delivered by those practitioners who have a situated and experiential understanding of the world of action (for a related argument see Enticott 2012). The following autoethnographic case study explores how this high level of situated expertise is acquired in the context of vine growing, and how it enables vine care. In the conclusion, I discuss some of the consequences that recognising experiential knowledge of farming as true expertise and a cornerstone of caring for agricultural natures may have for how we manage those environments.

2. Experiential knowledge and care: a synthesis

2.1 Farmers and experiential knowledge

In order to explore the inter-dependencies between care and experiential knowledge in farming we need to get to grips with the mechanisms through which experiential knowledge is acquired, and with the characteristics of experiential knowledge as different from other kinds of knowing. Most studies of farming knowledge explore its inter-personal dimension, using such frameworks as knowledge-cultures (Tsouvalis et al. 2000, Morris 2006, Riley 2008, McGreevy 2012), communities of practice (Oreszczyn et al. 2010), knowledge systems (Kroma 2005, Reyes-Garcia et al. 2014), knowledge communities (Nerbonne and Lentz 2003) and knowledge networks (Winter 1995, Silgo and Massey 2007). Central to these perspectives is the notion that 'knowledge is a social achievement, produced in specific spatial and temporal contexts as people collectively try to make sense of things and develop (unspoken) rules for doing so' (Morris and Holloway 2009: 321). This research has contributed much to current understandings of farming knowledge, and shown that farmers value and use different kinds of knowledges, including 'those developed through practical experience of agriculture, and the management of its natures' (Morris 2006: 125). These knowledges are variously referred to in the agro-food context as tacit (Morgan and Murdoch 2000), local (Clark and Murdoch 1997, Raymond et al. 2010), embodied (Carolan 2008), experiential (Goven and Morris 2012), or traditional (Berkes et al. 2000).

While the inter-personal dimension has been shown to be important to farmers' ways of knowing, crucially tacit, local, or experiential knowledge is seen to arise first of all through a direct relationship between farmers and the agro-ecology of the farm. Authors stress the importance of prolonged lived experience to the shaping of this kind of knowing. However, exactly how this knowledge is acquired has not been explored to date, a gap this article addresses. Tacit or experiential knowledge arises through and focuses on the relevant farming activity, be it cultivation of a particular plant (Van der Ploeg 1993) or animal species (Wynne 1992, Grasseni 2004, Singleton 2010, Holloway and Morris 2014), or a management of ecosystems typical of the farm (Burgess et al. 2000, Riley 2008). This way of knowing is seen as 'personal and context-dependent, and as such (…) difficult if not impossible to communicate *other than through personal interaction in a context of shared experiences*' (Goven and Morris

2012: 161, my emphasis). It is a form of knowledge that emphasises knowledge as practice as well as cognition (Morris 2010: 79). While farmers may be able to explain some aspects of what they do (Riley 2008), the acquisition of this knowledge happens not through 'being told', but experientially, through a directing of attention in the processes of doing (Ingold 2000). The autoethnographic case study presented in this article provides some empirical grounding to these largely theoretical literatures.

2.2 Farming as skill/craft

Recognising this centrality of the material world to the acquisition of tacit knowledge requires us to look much more closely at the relationship between farmers and their environments, and to explore how particular kinds of agrarian skill are acquired, which is what this article addresses in the context of vine work. One of the main findings about processes of enskillment (Ingold 2011), or of mind-bodies making sense (Harrison 2000) of the world of action is that sensing and sensation are central for the interaction between mind-body and its environment in the process of learning (Crossley 2007, Gieser 2008, Lea 2009). A skilled practitioner is aware of the world of their practice through diverse sensory inputs (Hockney and Allen-Collinson 2009, Paxson 2012), and they have a capacity to be affected, that is to become sensitive to the world, to be moved by it and to be 'put into motion by new entities whose differences are registered in new and unexpected ways' (Latour 2004, p. 210). But perception in itself is not enough, as to consider an enskilled body is to ask – what can a body do, in its environment? (Harrison 2000, p. 504). Becoming skilled means becoming attuned to the particular ways in which the material or environment unfolds, and to understand one's capacity to participate in this unfolding. Roof workers learn how to keep their balance (Strati 1999), care workers how to perceive unspoken needs of their patients (Yakhlef and Essén 2012), and glass-blowers how to anticipate changes in molten glass (O'Connor 2007). Thus 'education of attention' (Gieser 2008, Ingold 2000) can really be seen as a process of getting to know the world of action, and one's capacities to interact with it. Enskillment can thus be understood as an ongoing exploration and alignment of properties and actions, a never-ending experimental engagement in which both humans and materials both change and mutate. As a result of this centrality of the material to acquisition of skill,

'an account of the development of proficiency must attend not only to the development of bodily techniques (…) but also to the material of practice itself and the forged sensibilities of the material's properties in practice.' (O'Connor 2007: 138).

2.3 The inter-dependence of expertise and care

There is a striking similarity between the capacities characteristic of high levels of enskillment, and those which are seen as necessary to the enactment of care. The literature discussed above suggests that farming skill can be seen as an awareness of the farming environment, an attention to the changes in this environment, and a capacity to intervene at the appropriate time and in the appropriate way. Judging the appropriateness of action is where the question of care comes into play. Caring is different from simply making choices. As Mol (2008) argues, choices are seen as value-neutral, informed by objective information, and resulting from rational analysis of all known variables. In making choices, knowledge, action, and evaluation are separated – know

first, then act, evaluate later. Caring, on the other hand, does not separate knowledges, values and actions. When decisions are made, they are based on recognition that we cannot know all the possible variables, and that therefore we may not be able to foresee all the possible outcomes, but that we need to do something nonetheless. As a result caring is both experimental and ongoing. It has an implicit temporality and situatedness. While in the logic of choice the actor is separate from the world of action, and can leave the engagement at any time, the logic of care implies a continuity, and an interdependence.

Good care requires attentiveness, responsiveness, and adaptation in the face of always changing circumstances. And attentiveness, responsiveness, and adaptation are elements of true competence, as demonstrated by Dreyfus and Dreyfus' (1986) influential five-stage model of human learning. Dreyfus and Dreyfus show that as practitioners gain experience, they learn to recognise more and more variables in the environment of their action, which requires them to develop prioritisation. While novice and beginner practitioners proceed mechanistically in accordance to a pre-set 'programme', competent and more advanced actors engage actively with their environments, constantly drawing and re-drawing their plans in response to the situation. Strict procedures which were depended on in earlier stages of learning are abandoned in favour of flexible adaptation. Attending to the world of action gains in importance, as does personal responsibility. As Flyvbjerg explains

> 'the novice and the advanced beginner have only limited responsibility for the consequences of their actions [as these are] predetermined by (…) fixed learned rules. Excluding a gross error, a bad result will therefore appear as having been caused by inadequately specified elements and rules. (…) Competent performers, on the other hand, are personally involved with their actions. [They] feel responsible for the consequences of the choice (…) because selecting a plan [of action] cannot be done objectively, but must nevertheless be carried out in order to be able to act competently.' (2001, p. 13)

Thus expert action implies judgement, and caring about its results. Competent and expert practitioners feel a responsibility for the world in which they act. Action is no longer value-free; it is guided by subjective assessment of how best to proceed.

It is important to note that the behaviours and attitudes characterised by Mol (2008) as indicative of the logic of choice (separation of facts, actions, and values, limited personal responsibility, and closure) correspond to behaviours and attitudes typical of novices as noted by Dreyfus and Dreyfus (1986), while those she characterises as typical to the logic of care (see above) correspond to those Dreyfus and Dreyfus (1986) see as typical of competent and expert actors. In the context of farming, we can thus see that caring well – for a plant, an animal, a farm – can only be achieved by experts in their fields (Riley 2008). Care is not possible when the practitioner cares more about adhering to the rules and procedures than they do about doing the right thing, as doing the right thing is always contextual, local, and temporary. For beginners what constitutes 'the right thing' is judged in relation to rules, not in relation to the exigencies of the moment. In contrast, experts analyse the situation, not the rules, and do what normally works (Dreyfus and Dreyfus, 2005: 788). Thus to care well requires a level of expertise which goes beyond rule adherence. This has been commented on by Enticott (2012), who observed that experienced vets move beyond the protocol in testing for bovine tuberculosis. They note

that '[r]ather than unthinking automatons, [for experienced vets] knowing the test invokes a caring relationship, one for the farmer and the cattle. In this relationship, universalities do not apply (…) Care is situated in immediate localised relations and the ability to make these judgements is what distinguishes veterinary care from the veterinary identity defined by the protocol' (p. 83). The importance of moving beyond rules and towards attentiveness to the world of matter in vine care will be further explored in the following sections.

2.4 Caring for plants

Care in farming has to date been associated mainly with caring for animals, both in life (Holloway 2002, 2007) and in death (Singleton 2010). However, once we conceptualise care not as an extension of sentiment, but as a set of practices which enable the maintenance and continuation of a world, other farming non-humans, such as plants, can also be seen as objects of care. Care for plants, like the care for animals or humans, requires attentiveness and responsiveness, which in turn require a knowledge of what a 'good plant life' is. Where humans and some animals are more readily accessible to this kind of knowing, the alterity of plants presents practitioners with particular challenges. Plants are often seen to defy and indeed overbear human intentions, and control rather than care is more often evoked in relation to plants, as through their capacity for continuous, vigorous and unassisted growth they resist human attempts at containment (Hitchings 2003, Barker 2008, Ginn 2008)[1]. Some authors suggest that the perceived unruliness and obstinacy of plants arises from issues of temporal disjuncture (Bingham 2008) between plant and human activities (Richardson-Ngwenya 2012). Harmonious, or at least accommodating human-plant interactions, on the other hand, require humans to become attuned to and affected by the multiple temporalities of plants (Cloke and Jones 2001, Franklin 2006, Brice 2014).

Temporality emerges thus as an important element for understanding how to care for plants. The other element to consider is plants' relationality. Although rooted in a place, plants exist through their mutually impactful relations with others. Plants are promiscuous and opportunistic in enrolling various human, non-human and elemental others to further their growth and reproduction (Atchinson and Head 2013); they are also highly sensitive and adaptable to their environments. Plants are indeed so entangled in their environments as to challenge simple distinctions between individuals and collectives, landscapes and their constituents.[2] Caring for plants requires then knowledge of their involvement with multiple networks, including soils, climates, and pests. How this knowledge is acquired will be explored in the following sections.

3. Learning to care for vines

In the light of the literature discussed above, the following account illustrates the co-emergence of experiential knowledge and care in acquiring competence in vine work. As the only way to get to know embodied aspects of working knowledge is by doing it (McMorran 2012), this paper is informed by a nine month period of autoethnography as an apprentice vineyard worker at Colli Verdi, a winemaking cooperative in the Piemonte region in Italy.[3][4] While I conducted participatory observation at another three wineries and interviews at another sixteen, at Colli Verdi my engagement with vines, vineyards and vineyard workers was the most comprehensive. The winery participated in the WWOOF programme[5], and the vineyard workers were well

accustomed to training new vine apprentices. At the same time, Colli Verdi was dedicated to a care for their workforce which distinguished it from other wineries where vineyard workforce was typically seasonal. At Colli Verdi high level of employment was maintained throughout the year, and workers who may have trouble obtaining paid jobs elsewhere, such as an ex-convict, and a person with a slight mental disability, were employed when possible.

As a result of this wide intake, the existing workforce exhibited a variety in their vine skill. The 'core' of the vineyard team consisted of Damian, Peter, and Lena, who had worked the vineyards since the 1990s. Damian, a gardener by training, was the *caposquadra* (team leader). He had learnt vine pruning from practical experience and instruction by Virgilio, the founding father of the cooperative, whom he still consulted. Virgilio, like all viticulturists I had met in my research, had learnt to work vines by helping his father and other experienced vine workers (traditionally vine work is male-dominated). Lena was the only person in the team with formal viticulture training; all others acquired their skill 'on the job', although some had supplemented this with theoretical courses. A varying number of apprentices, and temporary workers, including the author, completed the 'team'. The diversity of vineyards managed by the cooperative, differing in vine type, vine age, soil type and parcel size, added to the complexity. At Colli I found a dedication to hands-on work in the vineyards combined with extreme heterogeneity of both vines and workers, from young to old, from experienced to novice, and from skilful to inept, which allowed me to build a comprehensive picture of vine pruning practice acquisition and performance. While I cannot claim to have become a fully competent vine worker (a moving goalpost by its very nature), my experiences of vine apprenticeship have offered important insights into what it takes to be one (Grasseni 2004, O'Connor 2007, Lea 2009). Using my body 'as an instrument of research' (Longhurst et al. 2008), I become a sympathetic participant (Rowles 1980) in viticulturalists' lifeworld.

To best convey the dynamism and sensuality the training, I illustrate my narratives with a video taken during my vine apprenticeship. This allows me to get close to particular moments of human-nonhuman sensuous encounter in the performance of practice. It helps to illustrate the embodied aspects of vine work, including dexterity and strength, and hopefully will help the readers to share the sense of alien-ness and strangeness which informed by early engagements with vines.

4. Learning to be affected by vines

The branches, although dead for months now, are still holding on to the wires with their thin but incredibly strong tendrils. The vine is further attached to the wires by plastic bands, and the branches are plaited into the wires and into one another. Pulling them off is difficult. The branches are hard and springy, when you pull at them sharply you run the risk of having them whip back, suddenly free, straight into your face. And that hurts! The branches are knobbly, tangled, long things, one completely different from another. Just when you think you've got it down, think again – one of the tiny little off-branches jerks you suddenly back, or one of the tendrils you missed nearly pulls the branch back out of your hand. We all work in gloves to protect our hands. After just a few minutes my back and arms start complaining, and I'm sweating in spite of the cold. (based on field diary 30/01/09)

Fig 1. and 2.

My first encounter with vines comes in the middle of winter. After the madness of the harvest both the vines and the workers enjoy a brief time off and pruning starts shortly after Christmas. Like in most vineyards in Italy, at Colli pruning is done by hand. Experienced workers are followed by novices, who pull down the cut-off branches from the wires. This is what I am struggling to do. My actions are awkward, and I tire quickly. I am amazed at the strength of the thin canes; I can feel their power in my whole body as they resist me. We test one another. Lena and Peter see me become increasingly agitated at the vines' obstinate, unyielding material. They help, showing me some tricks of the trade: cutting the branches up at the tangles, so that they don't catch; pulling with your entire upper body by turning away from the vine instead of pulling down just with the arms. Lena shows me the movement (fig. 1 & 2), and I try to imitate her. I watch Peter cut up the branches, and try to use my secateurs to the same effect. My back and fingers hurt, my feet are cold in the melting slush. It is not just me; we are all working hard, moving through the rows at a slow but constant speed. There are twenty hectares of vineyards at Colli Verdi. Winter is shaping up to be a long and bleak season indeed.

4.1. Vine pruning as enactment of cares

Vine pruning is a site where multiple cares are simultaneously enacted through the interaction between workers and plants. The aim of vine pruning is to 'hold back' the vigour of the vine which would otherwise channel much of its power into producing ever-more extensive networks of branches. Instead, the workers aim to direct the force of the plant into the production of grapes. This growth is further curtailed and directed as the number of grape bunches and the density of foliage is managed throughout the growing season. How a vine is pruned, how many bunches it is made to carry, and how its foliage is managed speaks to the overarching aims of the winery as a producer of particular kinds of wines; it both embodies and enacts the care for the winery as a commercial entity. To simplify, some industrial scale wineries prune the vines mechanically, prioritising cost and speed over quality of grapes. Conversely, small wineries such as Colli Verdi see the work done in the vineyards as the site of quality production.

This is not to say, however, that the aims of the winery to produce a certain type of wine automatically translate into workers' pruning decisions. Pruning vines is not an arbitrary process, but an activity shaped by the innate disposition of the vine to grow in a certain way, and a desire of the viticulturalist for certain outcomes. Pruning is a mutual accomplishment, re-negotiated each time the pruner and the vine meet. Good pruning holds in balance caring for the harvest and caring for the plant. Keeping these cares together (Taylor 2010) requires skilful interactions with the vines which are sensitive to both the needs of the plant (to live, to be healthy), and of the winery (to produce a certain kind of wine in a certain quantity). This in turn requires both a deep understanding of how vines in particular vineyards grow, react, and unfold, and of the transformation from grape to wine in this particular company. This kind of understanding does not exist in abstraction, but is derived from long-term interaction with the environment of the winery.

For a novice like me, the alterity of vine pruning is enormous; no amount of kinaesthetic alignment (Gieser 2008) can help me understand what is going on. While I continue to work in the vineyards, I also talk to the winemakers and try the wines, and start to mentally connect certain vineyards with certain wine labels. Basic rules are explained to me, both at the winery

and at the vineyard; but the knowledge of the rules does not automatically gear me up for action. Winter pruning is a case in point. I am told that at Colli Verdi most vines are pruned *Guyot* style, in which one fruit-bearing cane and one spur are left on the trunk. The cane will produce fruit in the coming season, while the spur will become the cane in two seasons' time. So far so good. The problems start when I task myself with 'finding' the cane and the spur in the branchy maze of an unpruned vine. No matter how often the difference between the trunk of the vine and the spur is explained to me, no matter how many times it is shown to me even, I do not *see* where the spur and the cane 'reside'. I run my fingers along the wood, I try to figure it out, but the mute, obtuse matter of the winter vine gives nothing away to me. I lack the perceptual competence of the knowledgeable worker; I do not know how to look, how to touch, how to feel. Through the pulling down of branches, and observing experienced workers, I attain some understanding of the affordances of the vine. I appreciate its strength, and its resilience to the deep cuts made into its flesh. But all I need to know is not there. I start to understand what is 'going on' on an abstract level, but I cannot do. Which is why, of course, novice vine workers are not allowed to cut winter vines.

4.2 Learning and the role of changing affordances

Winter vines present a static image of vines which belays their true nature as dynamic and unfolding entities. To be able to care for vines, I need to acquire a knowledge of their changing materiality, something that becomes possible in the spring. Spring signals the start of the green pruning season, which continues through various tasks practically until the harvest.[6] In spring vines allow me to engage with them in a new way.

The vines have advanced quite a bit since I last saw them as sad, leafless stumps. I never realised how dynamically they grew! They are producing shoots all over – from the very base, foot, of the vine, on the 'nod' where the old wood (the non-pruned part) meets new wood (the pruned part), from the spur, and from the cane. They don't look like much now, but each of those subtle green shoots has the capacity to become a woody, proper branch, and most of them are ready to carry fruit too. Shoots are lovely to touch... Sensually, it is a completely different experience to winter pruning. Before, I was struggling. Now, on the contrary, I have to pay special attention and be extra delicate to make sure I don't do damage (Peter told me I ought to 'caress the vine' at this stage). The touch carries a lot of responsibility – but not as much as in winter pruning, as the vine will continue putting out new shoots for a while yet, so any minor mistakes can be corrected later by leaving additional shoots. After all, I am allowed to do this work after a fifteen-minute tutorial, not a three-year hands-on training! There is more to see now, the vine seems more alive, and it is easier for me to start to think about the force it will need to create grapes, about how many grapes it can support, which branches it can develop, see it as a totality, a living thing. The shoots are a beautiful light green, and they are extremely vulnerable and brittle, they pop off the branch at the most delicate touch. You hardly need tools, we work with our hands. Soon they get covered in fragrant vine juice, it smells lovely, a fresh, green smell. (based on field diary 05/05/2009)

Spring vines exhibit a different set of affordances to winter vines, with a consequent change in my affective engagement with them, as the research diary excerpt illustrates. After Lorimer, I understand affordance to be a relational quality, arising from the meeting of 'the inherent, ecological characteristics of a nonhuman in relation to the phenomenological apparatus of the

body (human or nonhuman) that encounters and perceives them' (2007, p. 914). In this reading recognition and responsiveness do not exclusively depend on conscious efforts of a human actor, but are influenced by what the nonhuman being interacted with has to offer. Certain meetings make it easier to respond than others; it is easier for humans to connect with a panda than with an ant, or indeed a plant (see Lorimer 2007). While winter vines offered little purchase for my attempts at interaction, spring vines are more welcoming. The primary affordance of spring vines is the speed of their growth. By observing the development of tiny speckles of green into flower bunches into grapes, by attending daily to the rapid development of branches and leafs, I start to perceive vines as dynamic, unfolding entities, not mute, self-contained objects, and to become affected by them differently (Latour 2004). By being exposed to the dynamically growing vines I am able to develop an understanding not of the form of the vine before me, a knot of sticks and twigs, but of the vine's unfolding, what Adam refers to as *natura naturans*, each vine's own channelling of 'the force which gives rise to (...) observable phenomena, the invisible energy that is recognisable only through its products' (Adam 1998, p. 30). By relating these new experiences to the affordances I had encountered in winter: the strength of mature branches, or of the extensiveness of branch networks, I am able to build a fuller, temporal understanding of vine's materiality.

4.3 Communicating rules vs building awareness

Importantly, the spring affordances of vines enable a change in practice, allowing me to move on from following and observing to hands-on action. As in winter pruning, the task is to remove undesirable growth. Knowing how to perform this task requires an understanding of why certain growth may not desirable at certain times and in certain places. Like other novices, I am instructed by an experienced worker. In her crash course on green pruning (see video), Lena draws my attention to particular occurrences in the vine – for example two shoots growing closely together out of a single bud. The importance of these and not other cues is concurrently explained with reference to particular human or vine activities in the past or in the future. If the shoots grow too close together they will interfere with one another's growth, and make harvesting difficult. And so 'a rule of thumb' is to leave one shoot only, the one carrying grapes. But Lena tugs lightly at the second shoot of the pair, runs her fingers along it and locates a grape bunch. She explains she will ignore the rule this time as the grape yield this vintage is poor, and as both shoots are 'nice' and carry grape bunches. Both shoots stay on.

The rule of thumb is not where Lena derives the solution for the case in front of her. She is not adhering to a rule, but using the rule to communicate how her action is informed by past experience of vine growth and harvesting technique, and her expectation of the future activities of the vine and of vine workers (see Ingold 2000, p. 35). Lena cares for the vine, but she also cares for the workers, including herself. By using a rule of thumb, Lena can communicate to me both what she is attending to, and why it is important to do so, while never resolving the tension between different cares – leaving the two shoots together as a local prioritisation of the care for the harvest over the care for the workers. The rule of thumb is not a description of 'how the world is' (a 'know why', as per Morris (2010)), but an interpretation which is only significant (which only signifies, i.e. makes sense (Harrison 2000)) in the context of the unfolding relationship between Lena, this vine, other vines, and other workers, across time. The rule of

thumb is thus both a didactic tool ('attend to this') and a crutch to lean on ('I need to attend to this because').

The rule of thumb indicates a shared history of embodied experience, and so a certain temporality. Lena is engaging not just with what is in front of her right now, but considers all that may have come before, and all that may come after. The slow rhythms of vines result in epistemic distance (Carolan 2006): not all that is relevant can be perceived at one time. Even the past, seemingly the area of the known, is uncertain – Lena may have worked this vine before, but it is not possible to remember every single vine at every single stage of its development. There is no immediate feedback between action (of the worker) and reaction (from the material), and so no habitual and unthinking coupling of perception and action often identified as characteristic of skill (Gibson 2006, O'Connor 2007, Lea 2009). There is instead a constant informed attention to the potentials of the vine, and the needs of the task.

4.4 The telling of stories

The work in vineyards frequently involves the more experienced workers recounting local (hi)stories, which situate our activity within the wider historical landscapes of care: for vines, vineyards, and the future of the winery. The (hi)stories remind us of the multiple objects we are simultaneously caring for (Law 2010). In each vineyard pruning is re-valuated in light of the local context: a vine is not a vine is not a vine. Young Barbera vines at *Vigna Nuova*, replanted after a disease outbreak in the early 2000s, are being trained to produce fewer grapes and so Damian instructs us to leave only a few bunches on each vine. The next day working similar Barbera vines at *Vigna di Carla* we leave many bunches. There the land is more flat, and we are told the soil contains less clay. This is seen to result in grapes of lower quality, destined for demijohn wine, and so thorough pruning is not seen as necessary. The shape and character of the land and history of the vines matters even within the same vineyard.

During the first break, Damian gives us additional instructions.

Damian: A technical observation, the top part of this vineyard has suffered [the lack of rain] more, so if there are fewer grapes per plant there that is absolutely fine. (...) Because it's much drier there. Down here 12 grape bunches per plant are fine, up there – no.

Peter: There is another explanation here. When we planted this vineyard there were a few very dry years. The roots never reached a certain length, they remained quite short, so if there is no water they really can't get any.

Francesca: But doesn't it grow more roots, over the years?

Peter: Yes, but very slowly, because the soil is very compacted. (...) They're like babies that did not get enough to eat when they were little.

(field diary 07/05/09)

Telling stories, as opposed to recounting facts, Mol (2008) notes, is characteristic of the logic of care. 'While conflicting arguments work against each other, conflicting stories tend to enrich each other. And while adding up arguments leads to a conclusion, adding on stories is more

likely to be a way of rising more questions' (ibid p. 88). The vineyard and winery stories were not so much authoritative statements expressing a truth about particular materials and spaces, as cues for the guiding of perception so that the knowledge expressed (vines differ, the differing spans past and future, the differing requires a change in practice) could be rediscovered by the novice workers as they engaged with the vines (see Ingold 2011, p. 159). Although the character of the soil and the history of the weather and the vines were not perceptible there and then, through the telling of the vineyard's stories they were incorporated into our care.

In addition to the thinking-backwards and thinking-forwards, we were also encouraged to think 'sideways', considering the relations of which the vine was part. These relations were always materialising in the bodies of vines, whose every property could be seen as a condensed story (Ingold 2011, p. 30). Being attentive to these relations, and appreciating their power, we could become more sensitive to how our relation with the vine (through pruning) fitted in the wider mesh, and thus to care for them better. Storytelling encouraged us to note the differences in the flesh of the vines, to relate them to potential relational causes, and so to adapt our practice to the weaknesses and strengths of different vines and vineyards.

4.5 Experience and authority, and their limits

The more senior workers had a larger repertoire of experiences and stories to call upon at each instance of pruning, resulting in a greater sensitivity to the cues offered by the vine and the vineyard, considering, as Damian once said, a thousand things at the same time. To them the vines and vineyards afforded more than to the novice; they were more affected by the vines and vineyards (Latour 2004). They also stayed in daily communication with the winemaker and the cooperative founder, aligning the tasks in the vineyards with the needs of the wines. The more skilled and knowledgeable workers held greater authority (Sennett 2008), and were depended on for overseeing the work of others, for offering advice, and at times for making decisions about who would be allowed to work at all in situations when making mistakes was seen as too costly.

This is not to say, however, that through spending time working the vineyards one *automatically* became more attuned to the materiality of vines, or that all the experienced workers were attuned to the vines at all times. Just as the vines differed in their affordances, so the vineyard workers differed in their affective potential. Nilo was known as a 'butcher' as the vines he pruned were done harshly, without much individual attention and care. Damian in contrast was known as 'the gardener', or 'mummy' (*la mamma*). His constant careful attention epitomised the artisan-like, self-intensifying engagement with the world which tends to dominate work practice analysis in practice theory approaches (Bissell 2009). That was the reason why he and not another were the *caposquadra* (team leader).

However even for Damian staying attuned and careful required effort. Engaging with the vines in a meaningful way – seeing *and* perceiving – depended both on the nonhuman charisma (Lormier 2007) of the vines, and the affective capacity of the mindbodies of the workers. The attunement to the materiality of vines varied between individuals, and was different at different times. Working long hours bent in two, in increasingly hot weather brought the risk of 'switching to autopilot', as Damian called it, and making mistakes. Developing vine working skill was not the case of affordances and affects coming effortlessly together. It required constant and conscious, tiring mindfulness. The effort of skill implies both the possibility of mistake and failure,

and a differentiation to more-and-less capable practitioners (see also Lea 2009). This limit to skill was indeed visible in the vineyard work. Early on in the spring pruning one of the workers was taken off the team as she 'just wasn't getting it', costing the team too many grape bunches in a low yielding season. Similarly, at times we would come across vines which had been pruned without a spur, a mistake made in the winter pruning. This and other examples highlight the underlying chance not just of slippage, but of radical failure, without which this skill would not be skill at all, but a physiological function like breathing or digesting (see also Harrison 2009.

4.6 Care and uncertainty

While the experienced viticulturists in collaboration with winemakers led the way in vineyard work, this is not to say they did so on the basis of a perfect knowledge of the vines and vineyards, understood as a complete mastery over the vineyards as 'systems'. Their skill did not derive from a certainty about past and future cause effect relationships which are a pre-requisite of such managerial knowing (Adam 1998, pp. 81-82). Indeed vineyard work was characterised by a recognised uncertainty, or even indeterminacy, of cause-effect relationships, characteristic of care practices (Mol 2008). Having observed aberrance in the unfolding of the vines, experienced workers considered many possible causes and many possible effects. This related to everyday decisions about the pruning of singular vines, but also more widely to the caring for vineyards and the company.

The following two examples provide an illustration. As the spring turned to summer, the experienced workers noted there were fewer grape bunches than usual. Some vineyards in fact had produced hardly any grapes at all. This unexpected scarcity was much debated within the vineyard team. Tentative cause-effect relationships were proposed. Damian and Lena suggested the scarcity could be attributed to the impact of the spring weather two years previously. They also proposed it may have been exacerbated by the blinding of too many buds last winter. Virgilio brought to bear the outbreak of powdery mildew last year when the buds were forming. He also suggested the vines regularly went through low yield vintages. All these possible explanations were held as probable, and there were no attempts made to either 'deny' or 'confirm' the causal links. Instead of trying to determine what the cause was, the viticulturists worked on what could be done. A decision was made to adjust the pruning practice and not blind any more buds next winter, in the hope of improving the yield.

This approach was consistent with the logic of care explored by Mol (2008). As she notes, in the logic of care there is no 'single, crucial moment when all relevant fact-values are available. Problems emerge and as they are tackled new problems arise' (ibid p. 54). In the logic of care the impossibility of a God's eye point of view is explicit, and decisions are made not on the basis of objective facts, which are always beyond reach, but from subjective stances. The experimental and open-ended character of the decision is acknowledged, and the results are monitored. In the case of failure, a different approach is considered. This was well illustrated by the story of the low-yielding vineyard *di fronte Virgilio*. Over the years, different attempts have been made at increasing the productivity of this vineyard by changing the vine training system from *Guyot* to *cordone speronato*, and back again. The same type of vine (Timorasso) performed well in other vineyards, but just in that place it yielded nothing but branches, although it was subject to the same care and work, and although the vines suffered no visible illness. It was

decided a new approach would be tried, the vines would be ripped out the following winter, and new clones tried out in the unsuccessful patch. There was a limit to care there, and the time had come to let go (Mol 2008, p. 54).

For the viticulturists uncertainty about cause-effect relationships was expected. Past experiences and knowledges gained from other sources (friends, neighbours, even viticulture consultants) were brought in to inform observations of what was taking place in the present, but they were not depended on to deliver certainty about the past or the future. Past and future remained unbounded and indeterminate. The materiality of the vines was engaged with experimentally. Many elements of the experiment were known: unblinded buds will produce shoots; new vine clones will live. But some were not known: will the shoots carry grapes? Will the new clones produce a better yield? Previous experience and acquired knowledge provided possibilities, but not certainties.

Furthermore, there was no suggestion that such certainty was achievable. Viticulturists did not consider that complex agro-nature of vines and vineyards could be known in the scientific or managerial sense (Adam 1998, Mol 2008). Rather, the experiential knowing of vines and vineyards as 'processes rather than substances, irregular in their unfolding, open to other events, fluctuating in their identity' led viticulturists at Colli Verdi to an approach Mazis names 'a knowing of indeterminacy' (Mazis 1999, cited in Hinchliffe 2001, p. 185). They knew that complete knowledge *of* vines was not a realistic ambition. Viticulturists' knowing of indeterminacy did not indicate a lack, an end to otherwise successful control. The dream of control (Singleton and Law 2013) was never there in the first place. Instead care was practiced, with its typical flexible adaptation and an acceptance of uncertainty (Mol 2008). The workers knew – they had seen, over and over again – that vines and vineyards are open to endless relations and unforeseeable events; after all the vines grow, as one viticulturist put it, 'under this sky' (Vasco 25/02/2009). Their aim was not to produce knowledge *about* vineyards, but a *knowledgeable practice* of working *with* vineyards. Thus not control but creative tuning (Pickering 1995) of practice and material over long periods of time and across different vineyards was an extension of the skilful engagement with singular vines in singular encounters

5. Conclusions: the dependence of care on situated expertise, and its implications

The notion of care is becoming central to the reconceptualisation of agrarian space and practice. What this article argued is that care as the totality of those activities which enable the maintenance, continuation, and repair of the farming 'world', to paraphrase Fisher and Tronto's (1991) classic definition, depends on experiential knowledge. Feminist critiques of care have pointed out that care requires both know-what and know-how, as it depends on one's ability to first recognise and then appropriately react to the identified need (Tronto 1993). This article further explored the inter-dependence between knowledge and care in the context of vine work, arguing that the skills and attitudes authors such as Tronto (1993), Mol (2008) and de la Bellacasa (2010) have identified as central to caring are also those that can only be developed through acquiring situated expertise.

According to Tronto (1993) care requires attentiveness, the ability to note the need; responsibility, a recognition that one's position and knowledge give them an imperative to act; and competency, the ability to act according to the need. Mol (2008) further notes that in the

logic of care knowledge, action, and value are not separate, but are enacted together. What characterises care is not a detached analysis of available facts, but a careful experimentation by an involved actor who recognises that not all can be known, but that something has to be done nonetheless. What these authors recognise as pre-requisites for and characteristics of care are also what Dreyfus and Dreyfus (1986) recognise as characteristic of expertise. While novices obey rules, have a limited sensitivity to the world of action, and assume no personal responsibility, experts have a high awareness of the world in which they act, take responsibility for their actions, and respond accordingly not on the basis of certainty but through intuition. Expert behaviour is also characterised by openness and experimentation, and a dedication to continuous engagement.

An autoethnographic account of acquiring competency in vine work illustrated that experiential and embodied learning is central to developing good care, and that engagement with the materiality of the world of action – plants, vineyards, and winery – is crucial to developing situated expertise. Situated expertise was shown to be acquired not by observation and repetition, but through a process of personal discovery of the new affordances of the world and of one's mind-body emerging simultaneously and developing side by side. This process was aided by the recounting of (hi)stories and rules of thumb by more experienced practitioners, which helped to situate immediate action within the wider temporal and spatial contexts of care for multiple human and non-human others. However, while these interactions may have pointed the novice in the right direction, the learner was the one who had to make sense of them through repeated practical engagement.

In this concluding section I would like to move beyond the ethnographic material presented in the article and tease out some wider implications of recognising that situated expertise is central to delivering care in farming. What the ethnographic material illustrated was how situated expertise enables viticulturists to attend to their local cares: for the vines, vineyards, winery, workforce, and others. However, in addition to attending to these local cares farmers are increasingly required to care about a growing network of proximate and distant others, including diseases (Ilbery et al. 2012, Law and Mol 2008), ecologies (Burgess 2000, Kaljonen 2006, Morris 2006, Riley 2008), watersheds, carbon, and others. They are incentivised to take account of these non-local cares through regulation and auditing, which can create tensions with the local cares of the farmers, as Singleton's (2010) and Singleton and Law's (2013) papers on cattle tagging well illustrate. The regulatory regimes which seek to deliver care beyond the farm struggle with the flexibility and adaptation typical of farmers' activities, and see them as potentially endangering the aims of the larger systems. At the same time, as Singleton and Law (2013) show, delivering on these non-local cares depends on the capacity of the farmers to skilfully incorporate them into their principal concern of caring for the farm as an economic unit composed of various care-demanding humans and non-humans (Harbers 2010).

A close analysis of the relationship between knowledge and care in this article leads me to suggest that in order to make these wider care practices, which tend to be centrally organised and audited, fit more harmoniously with existing farming practices, and thus be both more acceptable and effective, we need to more explicitly recognise the situated expertise of farmers, and acknowledge their local cares and the practices of attending to them. This explicit valorisation of local expertise as central to delivering multiple levels of care through farming

should be complimented by a recognition of uncertainty, intuition, and experimentation as typical of farming expertise. The preceding case study noted decisions taken by viticulturists, in collaboration with winemakers, did not depend on precise measurement, but on making probable causal links between processes. The viticulturists considered a large number of variables qualitatively rather than a small number of variables quantitatively (see also Peloquin and Berkes 2009, p. 534). Knowledgeable engagement between workers and vineyards was not a control and mastery over their local environments (as per Van der Ploeg 1993, p. 212), but rather had the character of skilful coping, a knowing of indeterminacy (Hinchliffe 2001).

Classically, regulatory regimes struggle to accommodate uncertainty and adaptation. However, the recognition of uncertainty, the use of qualitative rather than quantitative information, and the role of intuition and experiment in decision making are all characteristic of high levels of expertise, and of the logic of care (Mol 2008). Dreyfus and Dreyfus (1986) have shown that while novice and competent performers rely on rational calculation, the jump to proficient and expert levels of skill is characterised by an increased dependence on intuition (see also Ingold 2000, Flyvbjerg 2001). Intuition in this context is to be understood not as guesswork or supernatural inspiration, but as what other writers on skill have described as maximum grip (Marleau Ponty 2001), flow (Csikszentmihalyi 1990), or being in harmony in the world of action (O'Connor 2007), in other words the capacity to respond quickly and accurately to the contingencies of the situation 'without the conscious analytical division of situations into parts and evaluation according to context-independent rules' (Flyvbjerg 22 p. 2001). It is important to note that the positive role of intuition in decision-making has been noted in other contexts such as engineering (Wetmore 2008), agronomy (Richardson-Ngwenya 2012), medical practice (Carmel 2013), and indigenous hunting (Anderson 2000, Ingold 2000, Peloquin and Berkes 2009). Intuitive action can then be understood as a form of intelligent behaviour, but one which goes beyond cognitivist understandings of humans as rational and calculating decision makers (Flyvbjerg 2001, p. 14), an understanding which typically underlies regulatory action.

The centrality of situated expertise to care, explored in this article, suggests that a practical recognition of uncertainty, flexibility, and adaptation as characteristic of care and of expertise in farming, merit further attention by scholars and policymakers alike. As indicated by other authors (Singleton 2010, Enticott 2012), it is the local adaptation, tinkering, and acknowledgement of uncertainty which enables abstract principles and rules presented by scientific and managerial practices to be reproduced as part of care-full farming. While this connection merits further attention, this and other studies indicate that such flexibility and adaptation need to be recognised, valorised, and supported, for it is these breathing spaces which enable a translation of rules and principles into care – as action-oriented knowledge. This is not to say that farmers as local experts are infallible, or that scientific and policy approaches have nothing to contribute to farming practice – this is plainly not true, and positive examples of science-farming knowledge collaborations exist (see e.g. Failing et al. 2013), although more are being called for (MacMillan and Benton 2014). What I suggest is that a way to improve farmers' delivery on non-local cares may be through a better integration of the practices of caring for distant or systemic others with existing farming practices, underlain by a recognition of and respect for farmers' experiential knowledge.

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[1] These same characteristics can be seen as enchanting by those in a position to give in to the prolificacy of plants, see Hitchings (2003, 2006), and Jones and Cloke (2002) on plants in domesticated settings.
[2] Ryan (2011) notes the importance of taxonomy in the changing of our dominant understanding of plants from plants-in-use to singular forms de-contextualised from their places, times, and use practices.
[3] All persons and companies in the text have been given pseudonyms. All direct quotes have been translated from Italian by the author.
[4] In this paper I have decided not to include the period of the harvest itself, as it is rather unusual when contrasted with the typical temporality of vine work (for an excellent analysis of grape harvest practices from a post-human perspective see Brice 2014). The harvest is characterised by an influx of workers from outside the winery, and an intense focus on the singular goal of getting the grapes into the winery at the right time.
[5] World Wide Opportunities on Organic Farms
[6] In this article I choose to use a direct translation from Italian (*potatura verde*) rather than the English term 'thinning' to indicate the continuity between winter and spring/summer activities. The pruning cuts made in winter belong to the same continual unfolding as the pruning of new shoots, leafs, and bunches. The vines are constantly worked as air circulation, pesticide penetration, ease of harvesting, making space for the developing fruit, shading or exposing it, removing secondary grape bunches, and other considerations come into play at different times of the year.

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